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Title:

Ambulance attendances resulting from self-harm after release from prison: a prospective data linkage study

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ABSTRACT

Objective: Incarcerated adults are at high risk of self-harm and suicide and remain so after release into the community. The aims of this study were to estimate the number of ambulance attendances due to self-harm in adults following release from prison, and to identify factors predictive of such attendances.

Methods: Baseline surveys with 1309 adults within six weeks of expected release from prison between 2008 and 2010 were linked prospectively with state-wide correctional, ambulance, emergency department, hospital and death records in Queensland, Australia. Associations between baseline demographic, criminal justice and mental health-related factors, and subsequent ambulance attendances resulting from self-harm, were investigated using negative binomial regression.

Results: During 4691 person-years of follow-up (median 3.86 years per participant), there were 2892 ambulance attendances in the community, of which 120 (3.9%) were due to self-harm. In multivariable analyses, being Indigenous (incidence rate ratio [IRR]: 2.10 [95%CI 1.14 – 3.86]), having previously been hospitalised for psychiatric treatment (IRR: 2.65 [95%CI 1.44 – 4.87]), being identified by prison staff as being at risk of self-harm whilst incarcerated (IRR: 2.12 [95%CI 1.11 – 4.06]) and having a prior ambulance attendance due to self-harm (IRR: 3.16 [95%CI 1.31 – 7.61]) were associated with self-harm attendances.

Conclusions: Ambulance attendances resulting from self-harm following release from prison are common and represent an opportunity for tertiary intervention for self-harm. The high prevalence of such attendances, in conjunction with the strong association with prior psychiatric problems, reinforces the importance of providing appropriate ambulance staff training in the assessment and management of self-harm, and mental health problems more broadly, in this vulnerable population.

Declarations of interest: None.

Key words: Self-injurious behaviour; prisons; emergency service; ambulance; data linkage.

INTRODUCTION

Incarcerated adults are at higher risk for both self-harm (1) and suicide (2, 3) compared with the general population. A considerable body of research has investigated patterns of suicide after release from prison (4, 5), with several previous population-based cohort studies demonstrating that formerly incarcerated adults are at increased risk of death by suicide (6-8). However, despite the strong association between self-harm and suicide (9-11), and that self-harm is a major source of both public health costs (12) and disability (11), it remains largely unknown whether the period following release from prison is also characterised by an increased risk of self-harm. As a consequence of this important gap in knowledge, it is difficult to provide evidence-based care for this vulnerable population.

Paramedics are often the first responders after self-harm and, as such, are likely to come into contact with vulnerable populations during such incidents. Indeed, a considerable portion of paramedics' time is consumed attending mental health-related presentations (13). These attendances place a heavy burden on resources and, along with attendances involving somatic illnesses, contribute to elevated levels of stress in many paramedics (14). It is also possible that clinical outcomes may be compromised when mental health-related attendances are managed sub-optimally (15).

Previous research has identified negative perceptions and a lack of empathy towards people who self-harm by paramedics, ED staff and paramedic students (16-18) and, in a recent Delphi study in the UK, experts in pre-hospital care identified treatment of patients who have self-harmed as a priority area for research (19). Students in pre-hospital care may benefit from evidence-informed training to work more effectively with mental health-related attendances, including those due to self-harm (20). To date, there have been very few published studies examining the number of ambulance attendances resulting from self-harm in any population (13). One recent report examining ambulance attendances due to self-harm and mental health problems in the general population in Queensland, Australia (21) revealed that patients in 71% of attendances resulting from self-harm reported a history of mental health problems. Women accounted for almost two thirds (64%) of attendances resulting from self-harm and cutting (78%) was overwhelmingly the most common method of self-harm utilised. One in six patients (17%) reported a previous suicide attempt. It remains unknown, however, whether adults with a

history of incarceration who are known to be frequent users of emergency departments (22) also use ambulance services frequently following self-harm.

More comprehensive evidence regarding the incidence, nature of, and precursors to ambulance attendances resulting from self-harm may improve clinical care and outcomes for patients, and inform training of paramedics and other emergency medicine practitioners. The primary aim of this study was to estimate the number of ambulance attendances resulting from self-harm in a representative sample of adults following release from prison in Queensland, Australia. The secondary aim was to identify factors predictive of such attendances.

METHODS

Study setting and population

This was a prospective cohort study using linked health data, conducted in Queensland, Australia. Participants were 1325 adult prisoners who were recruited into the Passports study (23), a randomised controlled trial of an intervention designed to increase primary and specialist health care utilisation for adults following release from prison. At the time of baseline interview between 2008 and 2010, participants were within six weeks of expected release from prison and able to provide informed, written consent. With the exception of the intentional over-sampling of women (to improve power for sex-stratified analyses), the cohort was representative of the population of people released from prisons in Queensland during the study period on assessed demographic and criminal justice variables (23).

Administrative data

We used data linkage to identify ambulance attendances, emergency department presentations and hospital admissions in the cohort. Ambulance, emergency department and hospital admission data were linked using probabilistic data linkage with clerical review. This is a routine linkage and previous research has found that it results in 0.1% of links being missing (false-negatives) or invalid (false-positives) (24). We obtained Queensland Ambulance Service (QAS) data relating to all ambulance attendances between 1 January 2007 and 1 January 2014. As such, information was available about participants' ambulance attendances before, during and after incarceration. These data were screened using a self-harm coding system adapted from a recent large-scale epidemiological study of self-harm (25) which has been described elsewhere (26). Ten percent of ambulance records were double-coded independently by two members of

the research team (KM and RB). Inter-rater reliability was very high: the kappa value for coding self-harm was 0.97 and for presentations involving suicide ideation with or without self-harm was 0.98. On this basis, the remaining records were coded by a single team member (KM). Records identified as involving self-harm/suicide ideation were then further coded to identify the method(s) of self-harm utilised; during this secondary coding, events were scored on a series of variables (such as "Did the event involve cutting / burning / poisoning? / self-harm ideation?") as either "0 = No or insufficient evidence on which to base a decision" or "1 = Yes".

We obtained evidence of a diagnosed mental disorder prior to release from prison through retrospective linkage with hospital admission and emergency department presentation databases, both of which are state-wide and have close to 100% coverage. Hospital records provided information on all hospital admissions in Queensland from 1 July 1999 to 31 July 2012 and included ICD-10 codes for both principal diagnosis and all secondary diagnoses (which included substance use disorders). Emergency department records (which contained only one ICD-10 code) provided information on all ED presentations in Queensland from 1 June 2002 to 31 July 2012, with mental health related presentations defined as those assigned ICD-10 codes F0-F99. We identified instances of re-incarceration in the cohort through prospective, deterministic linkage with Queensland Corrective Services (QCS) records. QCS data included a 'self-harm flag' that identified participants with a prior risk of self-harm whilst incarcerated, as recorded by prison health staff. QCS records were also used to identify the most serious offence for each participant's incarceration, which was coded as either a "violent" offence (including sex offences) or a "non-violent" offence (including offences against property, drug trafficking, driving, forgery/fraud). This coding was performed manually and was based on the Australian Standard Offence Classification (Queensland Supplement) (27). The Australian Institute of Health and Welfare (AIHW) linked participant data probabilistically to the National Death Index (NDI) to ascertain deaths in the cohort until 31 May 2013; death was treated as a censoring event.

Data collection

Baseline data were collected during structured face-to-face interviews that covered participants' demographic characteristics, physical and mental health, self-harm history, alcohol, tobacco and other drug use prior to and during their index incarceration (defined as their

current incarceration episode at the time of baseline interview), and other health-related risk behaviours. Demographic variables included age (derived from QCS records), sex, Indigenous status (Aboriginal and/or Torres Strait Islander vs. other), relationship status (married or in a de-facto relationship vs. other), level of education (<10 years of education vs. ≥10 years) and sexual identity (lesbian, gay, bisexual or transgender [LGBT] vs. heterosexual). Lifetime history of diagnosed mental illness was assessed by self-report using a question adapted from Australia's National Health Survey (28); participants were asked if they had ever been told by a doctor, psychologist or psychiatrist that they had a mental illness. Interviews typically took 60-90 minutes to complete and were conducted between August 2008 and July 2010. The recruitment and interview process has been described in detail elsewhere (23).

Ethics approval

Institutional Review Board (IRB) approval for the study was granted by The University of Queensland's Behavioural and Social Sciences Ethical Review Committee (#2007000607), the Queensland Health Human Research Ethics Committee and the Australian Institute of Health and Welfare Ethics Committee. All participants provided written informed consent prior to entering the study and the funding bodies had no role in the collection, analysis or reporting of the data.

Measurements

The primary outcome was ambulance attendances in Queensland resulting from self-harm after release from prison. The definition of self-harm used in this study was adapted from Madge et al. (29): "an act with a non-fatal outcome in which an individual deliberately initiates behaviour (such as self-cutting), or ingests an illicit drug or non-ingestible substance or object, with the intention of causing harm to themselves." We extended this definition to also include poisoning with any licit substance, as done in a recent large-scale epidemiological study of self-harm (25). Secondary outcome measures included contextual factors related to each self-harm event, including the method of self-harm used, the time of day of ambulance attendance, the length of time between release from prison and ambulance attendance, and the Glasgow Coma Scale (30) rating assigned to each participant by the attending paramedic.

Data analysis

Exposure variables were derived from the baseline interview (measured by self-report unless otherwise stated) and retrospectively linked data. Descriptive statistics were calculated for all measures. Crude comparative analyses for categorical outcomes were conducted using Pearson chi-square tests. Crude incidence rates with exact 95% confidence intervals were calculated assuming a Poisson distribution. Time at risk in the community was defined as the number of days between the date of index release and end of follow-up or date of death (whichever came first), minus any time spent re-incarcerated during follow-up. Due to count over-dispersion, we estimated the association between baseline measures and ambulance attendances for self-harm by fitting a negative binomial regression model, as recommended by Lawless (31). All models were adjusted for sex, age at release, Indigenous status, relationship status, level of education, sexuality, history of self-harm, previous self-harm ambulance attendance, prior identification of being at-risk for self-harm by prison staff, previous suicide attempt(s), lifetime history of mental disorder, diagnosed mental disorder prior to release from prison, previous hospitalisation for psychiatric treatment, and type of criminal offence. Covariate factors were selected based on a review of the self-harm literature.

Covariate data were missing for sexuality (n=1), QCS self-harm flag (n=10) and offence type (n=10). Missing covariate data were replaced by multiple imputation (MI) and all analyses were performed using Stata version 14.1 (32).

RESULTS

Of the original 1325 participants in the trial, linked health records were obtained for 1315 (99.2%), of whom 1309 (98.8%) were also linked to correctional records; all subsequent analyses were conducted on these 1309 participants. The median duration of community follow-up was 1411 days (3.86 years) per participant (interquartile range: 1060 to 1640), for a total analysis time of 4691.3 person-years. Table 1 shows the number of participants who were attended by an ambulance for any reason after release from index incarceration, disaggregated by whether the participant was residing in the community or prison (due to re-incarceration) at the time of ambulance attendance, and reason for attendance (i.e., all cause, self-harm ideation, and/or actual self-harm). A total of 780 (59.6%) participants accounted for 3082 unique ambulance attendances during follow-up; of these, 2892 (93.8%) occurred in the community and the remaining 190 (6.2%) occurred during a period of re-incarceration. Among those who were

attended by an ambulance at least once, the median number of attendances was 2 (IQR = 1 to 4).

INSERT TABLE 1 HERE.

Ambulance attendances resulting from self-harm after release from prison

A total of 133 (4.3%) ambulance attendances were for self-harm; of these, 120 (90.2%) occurred in the community and 13 (9.8%) occurred during a period of re-incarceration (i.e., ambulance attending a patient in prison). A total of 220 (7.1%) ambulance attendances involved self-harm ideation; of these, 207 (94.1%) occurred in the community and 13 (5.9%) occurred during a period of re-incarceration. Attendances resulting from self-harm were a subset of those involving self-harm ideation. Figure 1 shows the probability of participants having an ambulance attendance for a self-harm event or self-harm ideation after release from incarceration. Seventy-three (5.6%) participants were attended by an ambulance due to an act of self-harm at least once during community follow-up; of these, 51 (70%) did so within one year of release from prison (see Figure 1). This is reflected in the gradient of the line in the Kaplan-Meier curve in Figure 1, indicating that the period of highest risk was in the period immediately following release.

INSERT FIGURE 1 HERE.

Among the 73 participants who were attended by an ambulance for self-harm, 28 (38%) were first attended within 90 days of release and 23 (32%) were first attended between 91 and 365 days after release. The remaining 22 participants (31%) were first attended more than one year after release from prison. Fifty-two participants (71%) presented on one occasion only, 10 (14%) presented twice and 11 (15%) presented three or more times. The maximum number of ambulance attendances due to self-harm during follow-up was eight, recorded by two participants. Table 2 describes the baseline characteristics of participants and shows the number and rate of ambulance attendances resulting from self-harm according to these characteristics. The crude incidence rate of ambulance attendances for self-harm was 25.5 per 1000 person-years for females and 25.6 per 1000 person-years for males. Two fifths (41%; n=30) of those who received ambulance care due to self-harm had been identified by prison staff as

being at-risk of self-harm in their correctional records, and only one participant (1%) had a documented self-harm event during their index incarceration. Eighty-seven ambulance attendances (3% of the total number of post-release community attendances) involved self-harm ideation without an act of self-harm having occurred.

INSERT TABLE 2 HERE.

Table 3 displays the unadjusted and adjusted associations between baseline characteristics and subsequent ambulance attendances for self-harm. In multivariable analyses, participants with one or more ambulance attendances due to self-harm were more likely to be Indigenous, to have been previously identified by QCS staff as being at risk of self-harm, to have previously been hospitalised for a mental disorder, and to have previously been attended by an ambulance due to self-harm. Adjusted IRRs derived after imputation of missing covariate data differed little from the original adjusted IRRs.

INSERT TABLE 3 HERE.

Of the 120 community ambulance attendances resulting from self-harm, 110 (92%) resulted in the patient being transported to hospital for treatment. Compared with ambulance attendances not resulting from self-harm, those resulting from self-harm were more likely to involve a 'severe' Glasgow Coma Scale (GCS) score and were more likely to occur at a private residence, to result in transport to hospital, and to occur at night (see Table 4). The most common methods of self-harm were poisoning (55%) and cutting/burning (33%).

INSERT TABLE 4 HERE.

DISCUSSION

The aims of this study were to estimate the incidence of ambulance attendances resulting from self-harm in a representative sample of adults following release from prison in Queensland, Australia, and to identify the factors predictive of such attendances. Of 2892 ambulance attendances that occurred in the community after release from prison during an average of 3.86

years of follow-up, 120 (3.9%) were in response to self-harm. One in every 12 attendances (8.3%) was recorded as involving either self-harm or suicide/self-harm ideation. In a multivariable model, having an ambulance attendance resulting from self-harm was associated with being Indigenous, having previously been identified by prison staff as being at risk of self-harm, having previously been hospitalised for a psychiatric disorder, and having previously been attended by an ambulance due to self-harm.

The largest proportion of attendances occurred between 6pm and midnight and the most common method of self-harm recorded was poisoning, which is in line with recent findings from an Australian report examining ambulance attendances due to self-harm in the general population (13). However, there was no difference in incidence rates between women and men in our study, which is in contrast to recent prison (1), ambulance (13) and general population (25) data showing higher rates of self-harm in women than men. This might reflect the fact that male participants in our study engaged in more medically severe self-harm than female participants and, therefore, required a proportionally greater amount of medical attention than female participants. More than half of all attendances due to self-harm in our study involved poisoning, highlighting the high prevalence of co-occurring mental health, alcohol and other drug problems in this population compared with the general population (33). Participants were also more likely to have a prior reported suicide attempt than in Lloyd's general population study (13) of ambulance attendances resulting from self-harm and mental health issues (45% vs. 17%). This may reflect a heightened risk of suicide and more medically severe self-harm risk in this group than in the general population.

Although no previous studies have examined ambulance attendances due to self-harm following release from prison, a small amount of research has examined this issue in the general population. We observed a lower rate of self-cutting (78% vs. 33%) and a higher rate of previous suicide attempt (17% vs. 45%) than Lloyd et al. (21) reported in their findings from the general population in Queensland. The period of hghest risk for ambulance attendances due to self-harm was in the first year following release, which is similar to findings relating to the elevated acute risk of overdose deaths following release from incarceration (4).

Clinical implications

The high incidence of medically verified self-harm in this vulnerable and stigmatised population – in conjunction with our finding that one in every 14 attendances involved either self-harm or

suicide/self-harm ideation - has important implications. It is likely that this high prevalence of ideation reflects, in many cases, a form of help-seeking behaviour prior to engaging in an act of self-harm (34). It also reinforces the necessity for adequate levels of mental health-based training for ambulance staff, in order to facilitate the best - and most appropriate - outcome for vulnerable and marginalised patients. Recent figures indicate that more than 51,000 adults are released from incarceration annually in Australia (35). Based on this estimate - and using our finding of 120 community-based ambulance attendances for self-harm in 4691 person years - this equates to an estimated 1312 ambulance attendances due to self-harm by formerly incarcerated adults annually in Australia. Improved understanding of such attendances could inform prevention efforts, including those by emergency medicine professionals, as it is well established that many people who self-harm present to emergency medicine settings on multiple occasions (36, 37). Such data could be used to assist public health policymakers, correctional authorities, and emergency medicine professionals to plan and allocate resources.

The concentration of elevated risk for self-harm in participants with a psychiatric history suggests that many of those at risk have been previously identified as requiring additional support. This finding highlights the need for effective, evidence-informed post-release support for these particularly vulnerable individuals. Despite growing evidence of poor acute and long-term health outcomes for previously incarcerated adults (44-46), evidence-based responses to their complex health and social needs remain elusive (47, 48). Our finding that more than half (55%) of all ambulance attendances due to self-harm involved poisoning highlights the high prevalence of co-occurring mental health and alcohol and other drug problems in this population. Paramedics attending overdoses should be encouraged to consider the mental health needs of patients in such circumstances and not rule out the possibility that the overdose was intentional. This may, for example, warrant a referral to the crisis and assessment team in the ED for further investigation and linking with appropriate services.

Finally, a considerable amount of funding and research effort has been dedicated recently to preventing overdoses in formerly incarcerated adults (49-52), including research with paramedics in Australia (53, 54). However, despite the incidence of self-harm being higher than the incidence of nonfatal overdose in ex-prisoners (22, 52, 55), the same efforts have not been directed to this important issue. Giventhat pre-hospital professionals have also recently identified responses to self-harm as a priority area for further research (19), there is a clear

need for further research on the epidemiology and clinical management of such presentations, and on care pathways and clinical outcomes for these patients.

Limitations

Our study had some potential limitations. First, it is possible that some participants may have been attended by an ambulance as a result of self-harm outside of Queensland and, due to linkage with a state-wide ambulance attendance register, such presentations would not have been captured. However, recent Australian data based on analysing >220,000 patients (56) suggested that only three percent travelled across a border to access hospital services; as such, the number of ambulance attendances in our sample due to self-harm occurring outside Queensland is likely to be small. To the extent that we under-ascertained such events, our estimates of the incidence of self-harm would be conservative. Second, as most self-harm is not followed by help-seeking behaviour (57), it is likely that our approach considerably under-ascertained self-harm events (and definitely self-harm ideation) amongst participants; however, it is likely that we identified the more medically severe events. Third, as the right censoring date in our death records was eight months prior to the censoring date in our ambulance records, there is a possibility that we under-ascertained death as a censoring event. Given the small number of deaths it is likely that any impact on our findings was marginal, but the consequence would be an over-estimation of person-time and consequent under-estimation of the incidence rate. Finally, our study was limited by insufficient numbers to examine deaths due to suicide following release from incarceration. Population-based data linkage studies are recommended to compliment this more clinically-oriented research.

Our study also had several important strengths. These are the first published data of ambulance attendances resulting from self-harm in a sample of adults following release from prison internationally. Our findings provide one of the first estimates of the incidence of medically verified self-harm in this population and of ambulance attendances resulting from self-harm in any vulnerable population. Unlike previous studies, we combined rich survey data with prospective ambulance attendance data to capture self-harm events, instead of relying exclusively on self-report or administrative data.

Conclusions

Ambulance attendances resulting from self-harm following release from prison are common in this population and represent an opportunity for tertiary intervention and referral. The high

prevalence of such attendances, in conjunction with the strong association with a prior history of mental illness, reinforces the importance of appropriate training for emergency medicine staff when dealing with vulnerable and marginalised patients, such as those with mental disorder and those with prior contact with the criminal justice system. Further examination of the ongoing medical and psychiatric treatment of participants with medically verified self-harm, including those not transported to hospital, is recommended.

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Table 1: Ambulance attendances resulting from self-harm or self-harm ideation following release from prison

Type of attendance	Number of participants (N=1309)			Number of unique ambulance attendances (N=3082)		
	Community Number (%)	Prison Number (%)	Total[1] Number (%)	Community Number (%)	Prison Number (%)	Total Number (%)
For any reason	756 (57.8)	102 (7.8)	780 (59.6)	2892 (93.8)	190 (6.2)	3082 (100.0)
Self-harm ideation	109 (8.3)	7 (0.5)	112 (8.6)	207 (6.7)	13 (0.4)	220 (7.1)
Self-harm	73 (5.6)	7 (0.5)	77 (5.9)	120 (3.9)	13 (0.4)	133 (4.3)

[1] The same individual may have had ambulance attendances both in the community and in prison; thus the total number of participants may be less than the sum of the community and prison numbers.

Caption: The table shows data on ambulance attendances between the date of release from index incarceration (median: 19 August 2009; inter-quartile range: 6 March 2009 to 14 January 2010) and the study end date (1 January 2014).

Table 2. Baseline characteristics of participants and number with ambulance attendances for self-harm in the community following release from incarceration (N=1309)

Baseline variable	Number (% of cohort)	Number (%) with ambulance attendance due to self-harm (N=73)	Incidence rate of ambulance attendances due to self-harm (per 1000 person years)	95% CI
Gender				
Male	976 (79.0)	56 (76.7)	25.6	20.7 – 31.4
Female	260 (21.0)	17 (23.3)	25.5	16.8 – 37.1
Age at release in years				
18-24	316 (25.6)	19 (26.0)	19.2	11.9 – 29.4
25-39	636 (51.4)	42 57.5)	33.2	26.4 – 41.3
40+	284 (23.0)	12 (16.5)	15.5	9.2 – 24.5
Indigenous status				
Non-Indigenous	929 (75.2)	47 (64.4)	20.5	16.1 – 25.8
Indigenous	307 (24.8)	26 (35.6)	42.3	31.0 – 56.4
Relationship status				
Married or de-facto	806 (65.2)	52 (71.2)	21.1	14.7 – 29.3
Other	430 (34.8)	21 (28.8)	28.1	22.4 – 34.7
<10 years of education				
No	705 (57.0)	35 (47.9)	22.3	17.1 – 28.5
Yes	531 (43.0)	38 (52.1)	30.4	23.1 – 39.3
Sexuality				
Heterosexual	1165 (94.3)	65 (89.0)	23.6	19.3 – 28.6
LGBT	70 (5.7)	8 (11.0)	56.2	32.1 – 91.2
History of self-harm[%]				
No	1081 (87.5)	46 (63.0)	18.5	14.6 – 23.2
Yes	155 (12.5)	27 (37.0)	70.5	51.4 – 94.3
Previous self-harm ambulance attendance				
No	1190 (96.3)	60 (82.2)	18.7	14.9 – 23.1
Yes	46 (3.7)	13 (17.8)	183.8	128.7 – 254.5
QCS self-harm flag				
No	964 (78.6)	43 (58.9)	13.7	10.2 – 18.0
Yes	262 (21.4)	30 (41.1)	73.0	56.8 – 92.4

Previous suicide attempt[%]				
No	992 (80.3)	40 (54.8)	16.8	12.9 – 21.6
Yes	244 (19.7)	33 (45.2)	57.6	43.8 – 74.5
Lifetime history of mental disorder[%]				
No	713 (57.7)	28 (38.4)	13.7	9.6 – 18.9
Yes	522 (42.3)	45 (61.6)	41.8	33.3 – 51.8
Mental disorder diagnosis prior to release date[*]				
No	986 (79.8)	48 (65.8)	17.6	13.7 – 22.4
Yes	250 (20.2)	25 (34.2)	59.4	44.5 – 77.7
Hospitalisation due to mental health prior to release date[*]				
No	1019 (82.4)	39 (53.4)	12.8	9.5 – 16.9
Yes	217 (17.6)	34 (46.6)	81.7	63.8 – 103.1
Violent offence (index incarceration)				
No	579 (47.2)	36 (49.3)	26.0	19.7 – 33.6
Yes	647 (52.8)	37 (50.7)	25.4	19.5 – 32.6
Total	1309 (100.0)	73 (100.0)	25.6	21.2 – 30.6

LGBT = Lesbian / gay / bisexual / transgender; QCS = Queensland Corrective Services; 95% CI= 95% Confidence Interval; [%] Self-reported;
[*] Diagnosis of mental illness and/or substance use disorder, obtained from administrative data

Table 3. Associations between baseline characteristics and ambulance attendances for self-harm (N=1309)

Baseline variable	Unadjusted IRR (95% CI)	Adjusted IRR (95% CI)	Adjusted IRR (with imputed values) (95% CI)
Female	1.06 (0.52, 2.16)	0.67 (0.32, 1.42)	0.68 (0.32, 1.43)
Age at release			
18-24	1.00 (ref.)	1.00 (ref.)	1.00 (ref.)
25-39	1.92 (0.93, 3.97)	1.43 (0.74, 2.78)	1.44 (0.74, 2.79)
40+	0.83 (0.34, 2.07)	0.94 (0.39, 2.25)	0.92 (0.39, 2.22)
Indigenous	2.04 (1.09, 3.84)	2.10 (1.14, 3.86)	2.07 (1.13, 3.80)
Married or de-facto	0.85 (0.46, 1.60)	0.89 (0.50, 1.60)	0.89 (0.49, 1.58)
<10 years of education	1.27 (0.70, 2.28)	1.21 (0.70, 2.10)	1.19 (0.69, 2.06)
LGBT	2.39 (0.81, 7.04)	1.68 (0.61, 4.61)	1.69 (0.61, 4.65)
History of self-harm[$$]	4.09 (2.03, 8.23)	1.89 (0.93, 3.83)	1.89 (0.93, 3.84)
Previous self-harm ambulance attendance	10.32 (3.94, 27.01)	3.16 (1.31, 7.61)	3.17 (1.32, 7.65)
QCS self-harm flag	5.57 (3.13, 9.91)	2.12 (1.11, 4.06)	2.12 (1.11, 4.06)
Previous suicide attempt[$$]	3.49 (1.87, 6.50)	1.09 (0.55, 2.18)	1.09 (0.55, 2.17)
Lifetime history of any mental disorder[$$]	2.85 (1.60, 5.08)	1.40 (0.74, 2.65)	1.38 (0.73, 2.59)
Mental disorder diagnosis prior to release date	3.23 (1.71, 6.09)	1.40 (0.74, 2.65)	1.38 (0.73, 2.59)
Previous hospitalisation for psychiatric treatment	6.02 (3.39, 10.71)	2.65 (1.44, 4.87)	2.66 (1.45, 4.88)
Violent offence (index incarceration)	0.97 (0.54, 1.74)	0.76 (0.43, 1.33)	0.76 (0.44, 1.34)

IRR = Incidence Rate Ratio; LGBT = Lesbian / gay / bisexual / transgender; QCS= Queensland Corrective Services; 95% CI= 95% Confidence Interval; [$$] Self-reported

Caption: Incidence rate ratios (IRR) for ambulance attendances resulting from self-harm following release from prison were estimated using negative binomial regression. An exposure offset was specified and accounted for the duration of follow-up in the community for each individual, respectively. The adjusted IRRs are from a multivariable model

including all baseline covariates (*no bivariate association was observed between RCT intervention allocation and the primary outcome, so this was not adjusted for in the interest of parsimony).

Table 4. Contextual factors of **120 self-harm attendances and 2962 non-self-harm attendances following release from prison.**

Variable	Self-harm attendances N (%)	Non-self-harm attendances N (%)	p-value[a]
Method(s) of self-harm[$]			---
Poisoning	66 (55.0)	---	
Cutting or burning	40 (33.3)	---	
Battering	5 (4.2)	---	
Risk-taking	2 (1.7)	---	
Other/not stated	13 (10.8)	---	
Glasgow Coma Scale category			<.001
1. Minor (≥13)	99 (83.2)	2474 (94.6)	
2. Moderate (9-12)	5 (4.2)	59 (2.3)	
3. Severe (≤8)	15 (12.6)	81 (3.1)	
Attendance location			.007
Private residence	82 (68.3)	1434 (51.7)	
Public place	20 (16.7)	688 (24.8)	
Police/justice custody	12 (10.0)	327 (11.8)	
Health care facility	5 (4.2)	284 (10.3)	
Other	1 (0.8)	39 (1.4)	
Ambulance transport status			.045
Transported by QAS	110 (91.7)	2168 (84.2)	
Treated at scene	3 (2.4)	84 (3.3)	
Did not require treatment	5 (4.2)	303 (11.8)	
Died	2 (1.7)	19 (0.7)	
Time of day of ambulance attendance			.044
7:00am – 5:59pm	46 (38.3)	1476 (49.8)	
6:00pm – 11:59pm	50 (41.7)	975 (32.9)	
12:00am – 6:59am	24 (20.0)	511 (17.3)	

[a]Pearson chi-squared test; [$]Not mutually exclusive; QAS= Queensland Ambulance Service

Figure 1. Probability of participants having an ambulance attendance for a self-harm event or self-harm ideation after release from incarceration.